Aerobic exercise training for chronic obstructive pulmonary disease: What is the best regimen to increase heart rate variability?

Sir,

Chronic obstructive pulmonary disease (COPD) has recently been associated with reduced heart rate variability (HRV) in a large and well-written systematic review and meta-analysis,[1] with the authors finding a decrease in almost every HRV parameter. Previously, it has been shown that untreated reduction in HRV parameters is considered a life-threatening factor by increasing the risk of cardiovascular incidents and mortality.[2]

Among the approved treatments, aerobic exercise training has been proven to increase some parameters relating to HRV,[3] yet the heterogeneity of previous works leaves us with questions regarding the best intensity to conduct these exercises. Some studies showed that high intensities may themselves cause cardiovascular incidents, although some others approved using high-intensity training in these patients.[4] Whether these training sessions should be continuous or in regular intervals is also another point of contention, as both have been shown to improve HRV,[3] yet utilization of the interval regimen appears understudied in the literature, and comparisons of their effectiveness are not yet possible. The duration of each session, frequency of sessions, and duration of the training regimen may also affect HRV increase, yet these have been understudied as well. Previous works have demonstrated that three sessions per week for 2 months of medium-intensity exercise did not produce a noticeable increase in HRV parameters, yet five sessions per week for 2 months of moderate-to-vigorous intensity exercise, on the other hand, have been shown to increase HRV,[5] suggesting that higher frequencies of training appear to be more effective regardless of exercise intensity, yet direct comparisons between frequencies have not been distinctly studied as of yet.

To address the above-mentioned gaps in the literature, and to identify the best aerobic exercise training regimen for HRV promotion, we here at our hospital are conducting a randomized controlled trial to compare three different regimens of aerobic exercise training with walking on the treadmills (high-intensity long-interval versus high-intensity short-interval versus moderate-intensity continuous training) and with a separate control group receiving no exercise training. These regimens consist of shorter sessions (20 min versus 30–40 min), higher session frequencies (7 days a week versus 3 days a week), and a shorter regimen duration (2 weeks versus 4–12 weeks) in comparison to previous works,[3] allowing us to pinpoint factors most contributable to an HRV increase in COPD patients. In our study, patients with nervous system diseases affecting heart rhythm and diabetic patients were excluded.

Hopefully, the results of our study will help devise the most beneficial exercise training regimen for HRV promotion in COPD patients, reducing the risk for mortality and cardiovascular incidents in this already burdensome disease.

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Conflicts of interest

There are no conflicts of interest.

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